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ASSESSMENT OF CURRENT GLOBAL AND REGIONAL MEAN SEA LEVEL ESTIMATES BASED ON THE TOPEX/POSEIDON JASON-1&2 CLIMATE DATA RECORD

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Abstract

Recent developments in Precise Orbit Determinations (POD) due to in particular to revisions to the terrestrial reference frame realization and the time variable gravity (TVG) continues to provide improvements to the accuracy and stability of the PO directly affecting mean sea level (MSL) estimates. Long -term credible MSL estimates require the development and continued maintenance of a stable reference frame, along with vigilant monitoring of the performance of the independent tracking systems used to calculate the orbits for altimeter spacecrafts. The stringent MSL accuracy requirements of a few tenths of an mm/yr are particularly essential for mass budget closure analysis over the relative short time period of Jason-1&2, GRACE, and Argo coincident measurements. In an effort to adhere to cross mission consistency, we have generated a full time series of experimental orbits (GSFC std1110) for TOPEX/Poseidon (TP), Jason-1, and OSTM based on an improved terrestrial reference frame (TRF) realization (ITRF2008), revised static (GGM03s), and time variable gravity field (Eigen6s). In this presentation we assess the impact of the revised precision orbits on inter-mission bias estimates, and resultant global and regional MSL trends. Tide gauge verification results are shown to assess the current stability of the Jason-2 sea surface height time series that suggests a possible discontinuity initiated in early 2010. Although the Jason-2 time series is relatively short (~ 3 years), a thorough review of the entire suite of geophysical and environmental range corrections is warranted and is underway to maintain the fidelity of the record.